

REMARKS

The amendments to the specification add subject headings. No new matter is believed to be added to the application by this Amendment.

Status of the Claims

Claims 1-17 are pending in the application. The amendments to the claims clarify the language of the claims. The amendments to claim 1 incorporate the subject matter of claim 6. The amendments to claim 6 incorporate subject matter from claim 7. Claims 15-17 present subject matter canceled from the originally presented claims.

Rejection Under 35 U.S.C. 112, Second Paragraph (Paragraphs 1-2 of the Office Action)

Claims 3-7, 9 and 12 are rejected under 35 U.S.C 112, second paragraph as being indefinite. Applicants traverse.

The claims as amended are clear, definite and have full antecedent basis. Also, claim 3 as amended recites "transition metals." This clarifies the language of claim 3 and this clarified language finds support at page 3, lines 16-19 of the specification which recites "rare earths or the second or eighth subgroups."

Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. 102(b) Over Sadoun (Paragraphs 3 and 4 of the Office Action)

Claims 1-8, 10, 11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Sadoun (U.S. Patent No. 5,011,403). Applicants traverse.

The present invention pertains to a process for coloring translucent ceramics in a porous or absorbent state. The process entails coloring the translucent ceramics in a porous or absorbent pre-sintered state using metal ion solutions and/or metal complex solutions. The solutions contain rare earth elements or transition metals. The ceramics of the invention can be used as dental ceramics.

Sadoun pertains to an orthodontic bracket made from zirconium oxide. The ceramic of Sadoun is not porous. See Abstract of Sadoun, Sadoun at column 1, line 38 and claims 1-14.

Additionally, Sadoun at column 1, lines 41-43 states "In a preferred embodiment, the particle size of the ceramic is less than 0.5 microns. For example being included between 0.2 and 0.5 microns." That is, a ceramic having this very small particle size would be virtually impervious to penetration by a solution having a high surface tension resulting from ionic or complex substituents, such as can be found in the present invention.

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Nevertheless, the Examiner insists that "ceramics are inherently porous." See Office Action at paragraph 4, line 5. In contrast, the present invention such as is set forth in claim 1 recites "ceramics in porous or absorbent state."

Sadoun starts from a ceramic powder/binder mixture which already contains the coloring salt. That is, in Sadoun the coloring salt is added before the powder mixture is pressed to a pre-form. In contrast, the invention colors only after pre-sintering of the pre-form. See instantly amended claim 1. As a result, the coloring process of Sadoun is fundamentally different from that of the present invention.

Also, the coloring process according to the present invention is highly versatile and it can be performed either before or after shaping the pre-sintered body.

As has been shown, the non-porous ceramic of Sadoun fails to anticipate the process for coloring porous ceramics of the present invention. As a result, Sadoun fails to anticipate the instantly claimed invention. Further, Sadoun would fail to motivate a person having ordinary skill in the art to produce a claimed embodiment of the invention. Thus, Sadoun also fails to be utilizable to assert *prima facie* obviousness.

Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. 103(a) Over Sadoun (Paragraphs 5 and 6 of the Office Action)

Claims 9, 12 and 14 are rejected under 35 U.S.C. 103(a) as being obvious over Sadoun. Applicants traverse.

The failures of Sadoun to disclose or suggest the present invention have been discussed above.

The Examiner asserts that the "action time" would be determined by one of ordinary skill in the art based on the shade of color desired to be imparted to the ceramic. However, the technology of Sadoun is directed at non-porous ceramics, which have fundamentally different wetting and absorption properties than the porous ceramics of the present invention. As a result, a person having ordinary skill in the art would have no basis from the teachings of Sadoun to determine the "action time" by a course of experiments based upon the disclosure of Sadoun. Thus, a *prima facie* case of obviousness has not been demonstrated over Sadoun.

Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. 103(a) Over Hechler in View of Sadoun (Paragraph 7 of the Office Action)

Claims 1-6 and 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hechler (U.S. Patent No. 5,618,585) in view of Sadoun. Applicants traverse.

Hechler pertains to coated systems. The technology of Hechler entails multiple coatings of a metal oxide sol onto a substrate which can be a ceramic. The goal of Hechler is to produce a product having a high gloss by the application of multiple coats. Hechler at column 3, lines 11-20 discusses firing after the application of each coat or at least after the application of the first coat. That is, Hechler uses the first coat as a primer. Accordingly, Hechler teaches away from the present invention by using a primer coat to minimize the porosity in the substrate.

Also, the technology of Hechler is based upon applying a color coating system to finally-sintered unshaped ceramic parts. In contrast, the invention is directed at coloring pre-sintered parts. Thus, the technology of Hechler is fundamentally different from that of the present invention.

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Sadoun, which pertains to non-porous materials, fails to address the deficiencies of Hechler.

As a result, the combination of Hechler with Sadoun would fail to motivate a person having ordinary skill in the art to produce the claimed embodiment of the invention. Indeed, Hechler teaches away from the invention. Thus, a *prima facie* case of obviousness has not been made over Hechler and Sadoun. Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Prior Art Made of Record and Not Relied Upon by the Examiner  
(Paragraph 8 of the Office Action)

The prior art made of record and not relied upon by the Examiner shows the status of the conventional art which the invention supercedes. Accordingly, no additional remarks are necessary.

Information Disclosure Statements

Applicants thank the Examiner for considering the Information Disclosure Statements filed on August 3, 2001 and December 26, 2001 and for making the initialed PTO-1449 forms of record in the application.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a two (2) month extension of time for

filing a reply in connection with the present application, and the required fee of \$400.00 is attached hereto.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By 

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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The following header has been added before the paragraph beginning on page 1, line 5:

--Field of the Invention--

The following header has been added before the paragraph beginning on page 1, line 11:

--Background of the Related Art--

The following header has been added before the paragraph beginning on page 3, line 1:

--Summary of the Invention--

The following header has been added before the paragraph beginning on page 3, line 16:

--Detailed Description--

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) [Process for the colouring of] A process for coloring translucent ceramics in porous or absorbent state, [in] which comprises:

coloring the translucent ceramics in porous or absorbent pre-sintered state using at least one of metal ion solutions or metal complex solutions [are used for colouring].



2. (Amended) [Process] The process according to claim 1, [characterized in that] wherein the ceramics are dental ceramics [are coloured].

3. (Amended) [Process] The process according to claim 1 or 2, [characterized in that] wherein the solutions contain at least one of the ions or complexes of the rare earth elements or [subgroups.] transition metals.

4. (Amended) [Process] The process according to [claim 3, characterized in that] claim 1, wherein the solutions contain at least one of Pr, Er, Fe, Co, Ni or Cu.

5. (Twice Amended) [Process] The process according to claim 3, [characterized in that] wherein the ions or complexes are at least one salt or complex selected from the group consisting of chlorides, acetates, [or] alcohols [as well as] and oxo complexes[ are used as salts].

6. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein [dental] ceramics [are used in the pre-sintered state] based on zirconium oxide or aluminum oxide are used.

7. (Twice Amended) [Process] The process according to claim [1] 2, [characterized in that] wherein dental ceramics based on zirconium oxide or aluminum oxide are used.

8. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein the ion[ic] or complex[-containing] solutions are water-based or alcohol-based.

9. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein [the] an action time of the ion[ic] or complex[-containing] solutions is [a matter of hours, in particular] under two hours[, quite particularly under 1 hour and particularly preferably under 20 minutes].

10. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein the concentration of the solutions is 0.001 to 15 wt. [-] %.

11. (Twice Amended) [Process] The process according to claim 1, [characterized in that colouring] wherein the coloring takes place by immersion of the ceramic in the solutions, deposition of the solutions to the ceramic with the help of application instruments or by spraying of the solutions onto the ceramic.

12. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein the ceramics to be [coloured] colored have a diameter of 10 mm[, preferably 7 mm,] and a height of 7 mm[, preferably 5 mm].

13. (Twice Amended) [Process] The process according to claim 1, [characterized in that] wherein the ceramics are completely [through-coloured.] through-colored.

14. (Amended) [Kit,] A kit, comprising:

- (i) at least one stock bottle with a metal ion or metal complex solution for [the colouring] coloring of ceramics,
- (ii) a receptacle for the [colouring] coloring, and
- (iii) [optionally] a screen.

Claims 15-17 have been added.